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मानक

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IS 8964 (1999): Safety Conditions for Woodworking Machines
- Recommendations [PGD 3: Machine Tools]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक
काष्ठरूपण मशीनों की सुरक्षा शर्तें — सिफारिशें
(पहला पुनरीक्षण)

Indian Standard
SAFETY CONDITIONS FOR WOODWORKING
MACHINES — RECOMMENDATIONS
(*First Revision*)

ICS 79.120.10

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

February 1999

Price Group 3

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Machine Tools Sectional Committee had been approved by the Production Engineering Division Council.

This standard was first published in 1978 in the following parts:

- Part 1 General information
- Part 2 Circular saw benches
- Part 3 Surface planing machines with round cutterblocks, hand feed
- Part 4 Thickness planing machines with rotary cutterblocks
- Part 5 Single spindle one-side shaping machines
- Part 6 Table band sawing machines
- Part 7 Universal wood workers
- Part 8 Chain mortising machines
- Part 9 Disc sanding machines
- Part 10 Overhead belt sawing machines with sliding table or frame
- Part 11 Routing machines
- Part 12 Single and tenoning machines with one or several spindles
- Part 13 Double end tenoning machines
- Part 14 Planing machines of two, three, four side dressing
- Part 15 Single blade ending circular sawing machines with roller or chain feed, double and multi-blade circular sawing machines
- Part 16 Single blade strike circular sawing machines for cross cutting and ripping
- Part 17 Horizontal log band sawing machines
- Part 18 Vertical log band sawing machines
- Part 19 Band sawing machines with carriage but without dogging
- Part 20 Band sawing machines with rollers or roller table
- Part 21 Vertical and horizontal frame sawing machines
- Part 22 Band resawing machines
- Part 23 Glue spreading, lacquering and printing machines
- Part 24 Veneer clippers and veneer pack edge shears

This standard has been prepared with a view to formulate guidelines in the form of recommendations for safety requirements for woodworking machines amalgamating the above 24 parts into a single saleable and implementable user—friendly standard.

General information portion of the standard applies to all types of woodworking machines. The specific requirements of different types of machines have been covered under individual machines.

The main purpose of the present revision is to bring the safety requirements under a single cover to facilitate the reference and thus making the standard user-friendly.

In the preparation of this standard assistance has been drawn from EUMABOIS Recommendations for safety conditions for woodworking machines F-1 to F-24-1969 (in 24 parts), published by the European Committee of Woodworking Machinery Manufacturers.

Indian Standard

SAFETY CONDITIONS FOR WOODWORKING MACHINES — RECOMMENDATIONS

(*First Revision*)

1 SCOPE

1.1 This standard lays down recommendations with regard to safety provisions for woodworking machines and their accessories.

1.2 These recommendations do not cover protective measures outside of the machine itself (organization of workshops, installation of machines, protection against fire, health measures, etc) and are designed to make clear the point of view of the manufacturers of woodworking machines concerning measures of protection relating to design, manufacturing, sale and use of these machines.

2 REFERENCE

The following standard contains provisions which through reference in this text constitutes provision of this standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below:

IS No.

Title

1356 (Part 1):1972	Electrical equipment of machine tools: Part 1 Electrical equipment of machines for general use (<i>second revision</i>)
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3 GENERAL INFORMATION

3.1 All dangerous parts of machines which may cause accidents shall in general be covered or otherwise protected.

3.2 The recommendations of IS 1356 (Part 1), whilst not mandatory, should in general be observed for electrical equipment.

3.3 Each machine shall be switched 'on' and 'off' individually.

3.4 Use of dull blades shall be avoided.

3.5 No adjustments shall be done while the machine is in operation.

3.6 Devices for starting and stopping machines shall be placed within reach of the operator. They should not in themselves be the cause of accidents and should be protected against all accidental starting.

3.7 Stocks should not be forced into the machine faster than it will cut, nor should it be advanced so slowly that the blade overheats.

3.8 Machines shall be operated only by persons completely familiar with their operation and the use of their safety devices.

3.9 All high speed and heavy production type woodworking machines which give out large amount of dust/chips shall be either provided with self-exhausting system or suitable wood/chute arrangement for dust and chip disposal.

4 CIRCULAR SAW BENCHES

4.1 Guarding of the Blade

4.1.1 Beneath the machine table, the saw blade shall be guarded to prevent any accidental contact.

4.1.2 Behind the saw blade a riving knife shall be fitted carried from below the table. It shall be of suitable material, accurate in form and readily adjustable and suited to the thickness and diameter of the saw blade employed and be positioned as close as practical to the saw blade.

4.1.3 The distance between the saw blade and the riving knife should always be between 2 and 10 mm. This measurement shall be taken at the level of the table surface.

4.1.4 The exposed part of the saw blade shall be covered by a guard suited to the work.

4.2 Anti-Kick Back Device

When tools other than single saw blades are used and riving knives are impracticable, an alternative anti-kick back device for the workpiece shall be provided.

4.3 Push Stick

A suitable push stick shall be provided and kept available for use at every circular sawing machine which is fed by hand.

4.3.1 Except where the distance between a circular saw blade and its fence is so great or the method of feeding material to the saw blade is such that the use of a 'Push Stick' can safely be dispensed with,

the push stick so provided shall be used for the following purposes:

- a) To exert feeding pressure on the material between the saw blades and the fence throughout any cut of 300 mm or less in length;
- b) To exert feeding pressure on the material between the saw blade and the fence during the last 300 mm of any cut of more than 300 mm in length; and
- c) To remove from between the saw blades and the fence, pieces of material which have been cut.

5 SURFACE PLANING MACHINES WITH ROUND CUTTERBLOCKS, HAND FEED

5.1 Cutterblocks and Mounting of Blades

5.1.1 The woodworking surface planing machines shall be equipped with a round cutterblock.

5.1.2 The cutterblock shall be so designed that the blades tend to be retained even with insufficient tightening.

5.1.3 Dimensions (depth and width) of chip gullets shall be reduced to minimum measurements, consistent with adequate chip clearance.

5.1.4 The gap between the slots and the blade locking wedges shall have the minimum space necessary for locking and unlocking the screws. As an indication this should be about 6 mm.

5.1.5 The projection of the blade from the cutterblock, measured radially, should be 2.5 mm, *Max*.

5.2 Guarding of Blades

5.2.1 In the Working Area

5.2.1.1 The blades shall be completely covered by a guard going as far as the fence, whatever its position, or in the absence of a fence, blades shall be covered over their full length.

5.2.1.2 The guard shall rise up parallel to the cutterblock.

5.2.1.3 The operation of the guard shall be designed in such a way that the feed of the workpiece automatically puts the guard into place.

5.2.1.4 The guard shall have sufficient movement in order not to restrict the maximum capacity of the machine.

5.2.1.5 The guard shall be wider than the maximum working distance between the lips of the two tables, when set for maximum depth of cut.

5.2.1.6 The guard shall be capable of adjustment from the operator's position.

5.2.1.7 The guard should be sufficiently strong to resist shocks caused by the workpiece and, if necessary, support its weight.

5.2.1.8 The height adjustment of the tables should make it possible to reduce the free space between the thicknessing blades and the table lips to a distance of between 3 and 6 mm measured radially from the centre of the cutterblock.

5.2.2 In the Area Behind the Fence

The part of the cutterblock which is behind the fence shall be covered by an appropriate device travelling with the fence.

5.3 Stock Dimensions

Stocks of varying thickness shall not be planed at the same time (the thinner stock may be thrown back with great force).

6 THICKNESS PLANING MACHINES WITH ROTARY CUTTERBLOCKS

6.1 Cutterblocks

6.1.1 The woodworking thickness planing machines shall be equipped with a round cutterblock.

6.1.2 The cutterblock shall be so designed that the blades tend to be retained even with insufficient tightening.

6.2 Guarding of Cutterblock and Feed Rollers

The upper part of the machine, including the in-feed and out-feed rollers, shall be entirely covered in, thus preventing any accidental access to the cutterblock or feed rollers.

6.3 Safety Device at the In-feed End

6.3.1 The depth of cut shall be restricted by a cut limiting device preventing the in-feeding of oversized material.

6.3.2 Over the whole working width, the thickness planing machines shall be equipped with an effective anti-kick-back device.

6.4 Stock Dimensions

6.4.1 The shortest stock that may be planed shall be at least 50 mm longer than the distance between the rolls in the bed (usually not less than 350 mm long).

6.4.2 Stock of varying thickness shall not be planed at the same time.

7 SINGLE SPINDLE ONE-SIDE SHAPING MACHINES

7.1 Safety Device at In-feed End

7.1.1 For straight machining, the workpiece should be guided by a straight fence and contained by horizontal and vertical pressures.

7.1.2 For curved machining, the workpiece should be guided by a non-rotating ring.

7.2 Safety Device on Non-cutting Part of Tool

The non-cutting part of the tool shall be covered by a guard. This guard shall be so designed that it does not restrict the ejection of chips.

7.3 Safety Device on Cutting Part of Tool

The cutting part of tool shall be guarded by a guard appropriate to the nature of the work to be done.

7.4 Spindle Speed

The spindle speed selected shall be clearly indicated.

7.5 Brake

The woodworking one-side shaping machines shall be fitted with a suitable braking device.

7.6 Ring Fence

A ring fence shall be provided which is often mistaken for a guard.

NOTE – Ring fences are guides used to allow shaped rails, etc, to be cut and are designed to enable work to be firmly supported before it contacts the cutters.

8 TABLE BAND SAWING MACHINES**8.1 Guarding of Wheels**

8.1.1 The front side of disc wheels shall be guarded.

8.1.2 The front and rear sides of spoked wheels shall be guarded.

8.2 Guarding of the Blade

8.2.1 The overhead, down running portion of the blade (that part between the top saw guide) shall be guarded by a device moving with the guide.

8.2.2 The remaining non-cutting part of the blade shall be effectively guarded.

8.3 Brake

Machines with a wheel diameter of 315 mm or above shall be fitted with a suitable braking device.

8.4 Guide Post

The guide post shall be clamped about 6 mm above the stock to be cut.

8.5 Throat Plate

A worn throat plate shall be immediately replaced, because chips of wood may fall through and be caught between the blade and the lower wheel causing the blade to break.

9 UNIVERSAL WOODWORKERS**9.1 General Safety**

Each unit of the machine shall be provided with guards as applicable for the particular machine.

9.2 Guarding of Cutting Tools

9.2.1 All cutting tools shall be guarded in accordance with requirements for individual machines.

9.2.2 All moving cutting tools not in use shall be fully guarded.

10 CHAIN MORTISING MACHINES**10.1 Guarding of Chain**

10.1.1 The working portion of the chain shall be guarded on both sides.

10.1.2 The non-working portion of the chain shall be guarded. When the chain is in its position of rest, an automatic stop of the chain's revolution must be provided.

10.1.3 For machines in which the chain starts automatically as it is fed towards the cut, a device shall be provided to prevent accidental starting.

11 DISC SANDING MACHINES**11.1 Guarding of the Disc**

11.1.1 The non-working part of the disc shall be guarded.

11.1.2 The workpiece table shall be adjustable for reducing to the minimum the space between the disc and the table.

11.2 Protection Against Dust

The dust shall be efficiently exhausted.

12 OVERHEAD BELT SANDING MACHINES WITH SLIDING TABLE OR FRAME**12.1 Guarding of the Belt**

The nip points between the belt and pulleys shall be adequately guarded.

12.2 Protection Against Dust

The dust shall be efficiently exhausted.

13 ROUTING MACHINES**13.1 Guarding of the Tool**

The machine shall be designed so as to prevent any accidental contact with the tool and its chuck.

13.2 Guarding Against Flying Chips

A suitable device shall protect the operator against flying chips.

14 SINGLE END TENONING MACHINES WITH ONE OR SEVERAL SPINDLES**14.1 Guarding of the Tool**

The cutter heads shall be guarded when they are not effectively guarded by the frame of the machine.

14.2 Clamping of Workpiece

14.2.1 Workpiece shall be securely clamped.

14.2.2 Operation of the clamp shall not tend to put the operator's hand in contact with the tools.

15 DOUBLE-END TENONING MACHINES

15.1 Guarding of the Tool

15.1.1 All cutter heads shall be guarded when they are not effectively guarded by the frame of the machine.

15.1.2 A device which will allow the complete stoppage of the machine shall be provided.

15.2 Clamping of the Wood

15.2.1 The wood shall be securely clamped.

15.2.2 The use of this clamp in **15.2.1** shall not constitute a danger to the operator.

15.3 Guarding of the In-Feed End

15.3.1 A device which will allow the complete stoppage of the feed in any position shall be provided.

15.3.2 In the case of the reciprocating motion with hand loading, the feed shall stop in the loading position after the completion of the working cycle.

16 PLANING MACHINES WITH TWO, THREE OR FOUR-SIDE DRESSING

16.1 Cutterblocks

16.1.1 These machines shall be equipped with round cutterblocks. In planing machines where horizontal and vertical moulding work is done, square cutterblocks are permitted.

16.1.2 The cutterblocks shall be so designed that the blades tend to be retained even with insufficient tightening.

16.2 Guarding of Cutterblocks

The tops and sides of the thickening cutterblock and the side spindles and of the lower part of the surfacing cutterblocks shall be guarded to prevent accidental access of the cutterblocks.

16.3 Safety Devices at the In-Feed End

16.3.1 The depth of cut shall be restricted by a cut limiting device preventing the in-feeding of oversized material.

16.3.2 Over the whole working width these machines shall be equipped with an effective anti-kick-back device.

16.3.3 The first in-feed roller shall be entirely covered in order to prevent any accidental access.

17 SINGLE BLADE EDGING CIRCULAR SAWING MACHINES WITH ROLLER OR CHAIN FEED, DOUBLE AND MULTI-BLADE CIRCULAR SAWING MACHINES

17.1 Guarding Against Ejected Material

The machines shall be so designed that kick-back of the workpiece and throwback of splinters are prevented.

17.2 Guarding of the Saw Blades

Saw blades shall be guarded against accidental access.

17.3 Feeding Device

The feed, mechanism shall be capable of being stopped independently of the saw spindle.

18 SINGLE-BLADE STROKE CIRCULAR SAWING MACHINES FOR CROSS CUTTING AND RIPPING

18.1 Guarding of the Blade and the Spindle

18.1.1 The non-working portion of the sawblade shall be guarded.

18.1.2 Both ends of the spindle shall be guarded.

18.1.3 When in the non-cutting position, the whole blade shall be rendered safe by its position or by guarding.

18.1.4 Machines not fitted with a device for returning the blade to the rest position shall be fitted with a self-acting guard for the cutting portion of the blade.

18.2 Limitation of Movement

18.2.1 Hand operated crosscut saws shall be fitted with a stop to limit forward movement.

18.2.2 On saws with power operated stroke which are not part of a production line, the stroke action will cease at the completion of each working cycle. In those machines with a cutting capacity of more than 300 mm the operator shall be able to stop forward stroke in any position.

18.3 Riving Knife

Machines used for ripping solid timber shall be fitted with a riving knife.

19 HORIZONTAL LOG BAND SAWING MACHINES

19.1 Guarding of the Wheels

19.1.1 Front side of all wheels shall be guarded.

19.1.2 Rear side of spoked wheels shall be guarded.

19.2 Guarding of the Blade

19.2.1 The non-working portion of the blade shall be guarded by an appropriate device able to retain the blade in case of breakage.

19.2.2 The cutting portion of the blade shall be guarded by a device automatically placed and opening the sawing areas only during the movement of the log.

19.3 Guarding of the Carriage

19.3.1 Wheels, rollers guides, roller paths of carriages shall be guarded against pinch points.

19.3.2 When carriages are power operated they should be so constructed as to prevent accidental starting.

19.4 Control of Feeding

Machines controls should be so placed as to allow the operator to watch the sawing process whilst retaining full control.

19.5 Brake

The machine shall be fitted with a suitable braking system.

19.6 Mobile Machines

On the stationary log, mobile machines, a safety platform, moving with the frame, shall be arranged for the operator.

20 VERTICAL LOG BAND SAWING MACHINES

20.1 Guarding of Wheels

20.1.1 Front side of all wheels shall be guarded.

20.1.2 Rear side of spoked wheels shall be guarded.

20.2 Guarding of the Blade

20.2.1 The non-working portion of the blade shall be guarded by an appropriate device able to retain the blade in case of breakage.

20.2.2 During the setting up of the log, the actual cutting section shall be guarded by a device placed:

- a) automatically when the carriage is power driven, and
- b) by the operator when the carriage is manually operated.

20.3 Guarding of the Carriages

20.3.1 Wheels, roller guides, roller paths of the carriages shall be guarded against pinch points.

20.3.2 When carriages are power operated these should be so constructed as to prevent accidental starting.

20.4 Control of Feeding

Machines controls should be so placed as to allow the operator to watch the sawing process whilst retaining full control.

20.5 Brake

The machine shall be fitted with a suitable braking device.

21 BAND SAWING MACHINES WITH CARRIAGE BUT WITHOUT DOGGING

21.1 Guarding of Wheels

21.1.1 Front side of all wheels shall be guarded.

21.1.2 Rear side of spoked wheels shall be guarded.

21.2 Guarding of the Blade

21.2.1 The non-working portion of the blade shall be guarded by an appropriate device able to retain the blade in case of breakage.

21.2.2 During the setting up of the log, the actual cutting section shall be guarded by a device placed by the operator.

21.3 Guarding of the Carriage

21.3.1 Wheels, roller guides, roller of the carriages will be guarded against pinch points.

21.3.2 When carriages are power operated they should be so constructed as to prevent accidental starting.

21.3.3 Hand operated carriages shall be equipped with handles for the operators to push.

21.4 Control of Feeding

Machine controls should be so placed as to allow the operator to watch the sawing process whilst retaining full control.

21.5 Brake

The machine shall be fitted with a suitable braking device.

22 BAND SAWING MACHINES WITH ROLLERS OR ROLLER TABLE

22.1 Guarding of Wheels

22.1.1 Front side of all wheels shall be guarded.

22.1.2 Rear side of spoked wheels shall be guarded.

22.2 Guarding of the Blade

22.2.1 The non-working portion of the blade shall be guarded by an appropriate device able to retain the blade in case of breakage.

22.2.2 During the setting up of the log, actual cutting section shall be guarded by a device placed by the operator.

22.3 Guarding of the Carriages

When carriages are used they shall be equipped with handles for the operators to push.

22.4 Control of Feeding

Machine controls should be so placed as to allow the operator to watch the sawing process whilst retaining full control.

22.5 Brake

Machine shall be fitted with a suitable braking device.

23 VERTICAL AND HORIZONTAL FRAME SAWING MACHINES

23.1 Vertical Frame Sawing Machines

23.1.1 The moving parts, that is, the rods, cranks, wheels, chains, etc shall be guarded except when guarded by the construction of the machine.

23.1.2 When setting up with the frame in the upper position, methods shall be provided to prevent accidental downward movement of the frame.

23.1.3 Pressure rollers in the upper position shall be locked to prevent them from falling down.

23.2 Horizontal Frame Sawing Machines

23.2.1 The moving parts, that is, the rods, cranks, wheels, chains, etc shall be guarded.

23.2.2 The frame and connecting rod should be protected against their possible projection in case of breakage of the connecting rod.

24 BAND RESAWING MACHINES

24.1 Guarding of Wheels

24.1.1 Front side of all wheels shall be guarded.

24.1.2 Rear side of spoked wheels shall be guarded.

24.2 Guarding of the Blade

24.2.1 The non-working portion of the blade shall be guarded by an appropriate device able to retain the blade in case of breakage.

24.2.2 Access to the actual cutting section shall be prevented by the construction of the machine.

24.3 Guarding of the Feed Devices

The rollers or other feed devices shall be inaccessible or guarded. For machines used for non-squared logs, the guarding may be omitted if the machines are equipped with a device allowing clamping through the rollers and their rapid separation.

24.4 Control of Feeding

Machine controls should be so placed as to allow the operator to watch the sawing process whilst retaining full control.

24.5 Brake

The machine shall be fitted with a suitable braking device.

25 GLUE SPREADING, LACQUERING AND PRINTING MACHINES

25.1 Guarding of In-Feed Rollers

25.1.1 Glue spreading machines and machines for the application of lacquer shall be equipped with a protective guard in front of the rollers to prevent clothing or parts of the body from being accidentally caught.

25.1.2 The machines shall be capable of being stopped rapidly from any point on the in-feed side, even without hands (emergency stop).

25.2 Protection Against Explosions

Machines in which solvents with a low flash point are used shall be equipped according to the special rules for protection against explosions.

26 VENEER CLIPPERS AND VENEER PACK EDGE SHEARS

26.1 Guarding of the Shear Blades (Veneer Clippers)

Accidental contact with the shear blades shall be prevented by the provision of appropriate guarding arrangements which do not hamper visibility of the working area.

26.2 Guarding of Veneer Pack Edge Shears Without Pressure Bar

26.2.1 Wherever possible machines without pressure bar should be guarded as veneer clippers under **26.1**.

26.2.2 When this is not possible, for example, because of technical operation reasons, the operating controls should be such that both hands are required for the full length of the stroke. Releasing even one of the controls shall cause immediate stopping of the shears.

26.3 Guarding of Veneer Pack Edge Shears with Pressure Bar

Machines with pressure bar shall be designed so as to allow automatic stopping and locking of the shears and of the pressure bar in the high position after shearing. Switching on shall be performed only by means of controls operated by both hands, during the full length of the stroke. Releasing even one of the controls shall cause immediate stopping of the shears and the pressure bar.